

I-405 Renton to Bellevue Express Toll Lanes and Widening Project

Owner: WSDOT

I-405, Renton to Bellevue Widening & and Express Toll Lanes Project

DOCUMENT REVIEW

- ☐ APPROVED, NO EXCEPTION TAKEN
- ☒ APPROVED AS NOTED
- ☐ RESUBMIT, REVISE AS NOTED

REVIEWED BY: J. Broadus DATE: 1/6/22

Review is for general conformance with contract or design documents. Sole responsibility for correctness of dimensions, details, quantities, materials, and safety during fabrication and erection shall remain with the contractor.

Pile Driving Equipment Approval BR26E (I-405 OVER 44TH) PIER 2

Prepared in accordance with:
WSDOT Standard Specification, dated Jan 7, 2019,
section 6-05.3(9)

Prepared by: Ilima Alexander (FLJV)
Date: 12/23/2021

FLATIRON



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Pile Lifting Eye and Stiffened End Sketch

Leads

Driving Cap

200-6 Vibratory Hammer

300-4 Vibratory Hammer

Antaeus 325-6 Vibratory Hammer

D-80 Hammer

D-100 Hammer

WSDOT Email Correspondence: Non-Fixed Leads

Build Template

A fork-lift-supported pile driving template made of welded channels and angle iron will be used. See following pages for details. The welded angle and channel frame that the pile will be driven through will be dimensioned such that the pile will not walk more than 6 inches from horizontal plan location as required per WSDOT Spec. Section 6-05.3(11) A. Wood shims bolted to the pile side of the frame will prevent gouging or other damage to the pile.

Test piles

Procedure for driving test piles shall conform to 2018 WSDOT Standard Specification, Amended Jan 1, 2019, Section 6-05.3(10).

Prior to driving the Test Pile, during pre-construction meeting, the required Nominal Pile Driving Resistance (R_{ndr}) should be determined.

Test piles shall be driven to at least 15 percent more than the ultimate bearing resistance required for the permanent piles, except where driving criteria is determined by the wave equation. Test piles shall penetrate at least to any minimum tip elevation specified in the Contract. The Engineer may direct the Contractor to overdrive the test pile to more than 15 percent above the ultimate bearing resistance for permanent piles, or if the wave equation is used to determine driving criteria, the Engineer may direct the Contractor to overdrive the test pile above the ultimate bearing resistance.

The pile driving system will be analyzed by a Pile Driving analyzer to verify driving stresses in the pile are not increased due to eccentric loading during driving, and transferred hammer energy is not reduced due to eccentric loading during driving, for all test piles and at least one production pile per pier. This is in accordance with WSDOT Standard Specification, section 6-05.3(9)C, bullet point 2.

Test piles and permanent piles shall be driven as described below.

The forklift should have sufficient counterweight for securing the template in position and prevent the template from shifting during the pile installation.

Step 1: Vibratory Install to 20ft depth at a minimum

The vibratory hammer will be lofted using a main line. Using a key way in the pile, the pile will be lofted with the other main line. The vibratory hammer will clamp on to the pile and both will be swung into position through the forklift-supported template. The pile will be driven to a minimum of 20ft. A vibratory hammer allows pile to be driven and extracted as needed to ensure plumbness. Additionally, to ensure plumbness a level will be used to check the pile is installed such that the top 10 feet of the pile is within 4 percent of the specified alignment as required per WSDOT Spec. Section 6-05.3(11)A. This may require the vibratory hammer to be stopped periodically. This is in accordance with WSDOT Standard Specification, section 6-05.3(9)C, bullet point 1.

The required bearing resistance for all piles driven with vibratory hammers will be determined according to WSDOT Specification Section 6-05.3(12) by driving the pile at least an additional 2 feet using an impact hammer. This method of determining bearing resistance will be accepted provided the blows per inch are either constant or increasing. If the pile cannot be driven 2 feet, the pile will be considered acceptable for bearing if the pile is driven to refusal. This is in accordance with WSDOT Specification Section 6-05.3(9)B.

Step 2: Impact Install

For piles requiring PDA, after vibratory install and before impact install the PDA consultant will attach PDA wires to the pile. Pile will be driven to minimum tip and bearing under direction of the PDA consultant. For piles that don't require PDA, skip the step above. After vibro install to a minimum of 20ft, a diesel hammer will be used to drive the pile to required capacity and minimum tip using the pile criteria and blow count chart.

Additional Installation Information for Pier 2 South Piles

The piles on the south side of pier 2 were ordered in 90ft lengths. Driving will stop when the top of the pile is near the ground surface and the pile will be spliced. Submittal 1743 contains the spliced pile welding procedure. Once splice is complete, driving will commence.

Additional Information Regarding Overburden

The ground elevation the piles will be driven through is about 18 to 30 feet higher than the pile cut off elevation. This material will be excavated away during the installation of soil nail wall 7.47C, located immediately to the north of pier 2. The wave equation analysis submitted with this document takes into account driving through overburden.

PILE DRIVING TEMPLATE: FORKLIFT SUPPORTED FRAME

Bolts tighten over forks.
Come-alongs will be used to
secure frame to forklift.

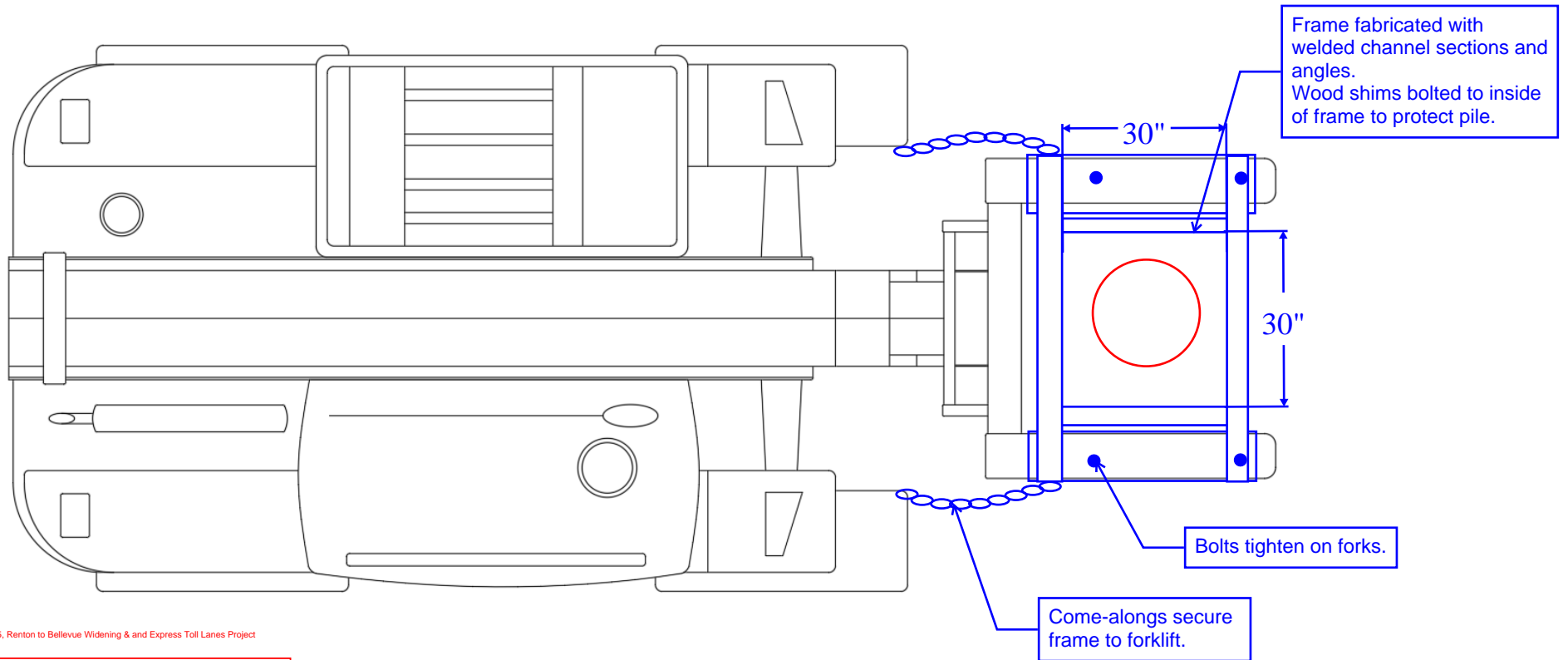
Slide over forklift forks.



Frame is 30" x 30"
(inside dimensions)



PILE DRIVING TEMPLATE: FORKLIFT SUPPORTED FRAME



I-405, Renton to Bellevue Widening & and Express Toll Lanes Project

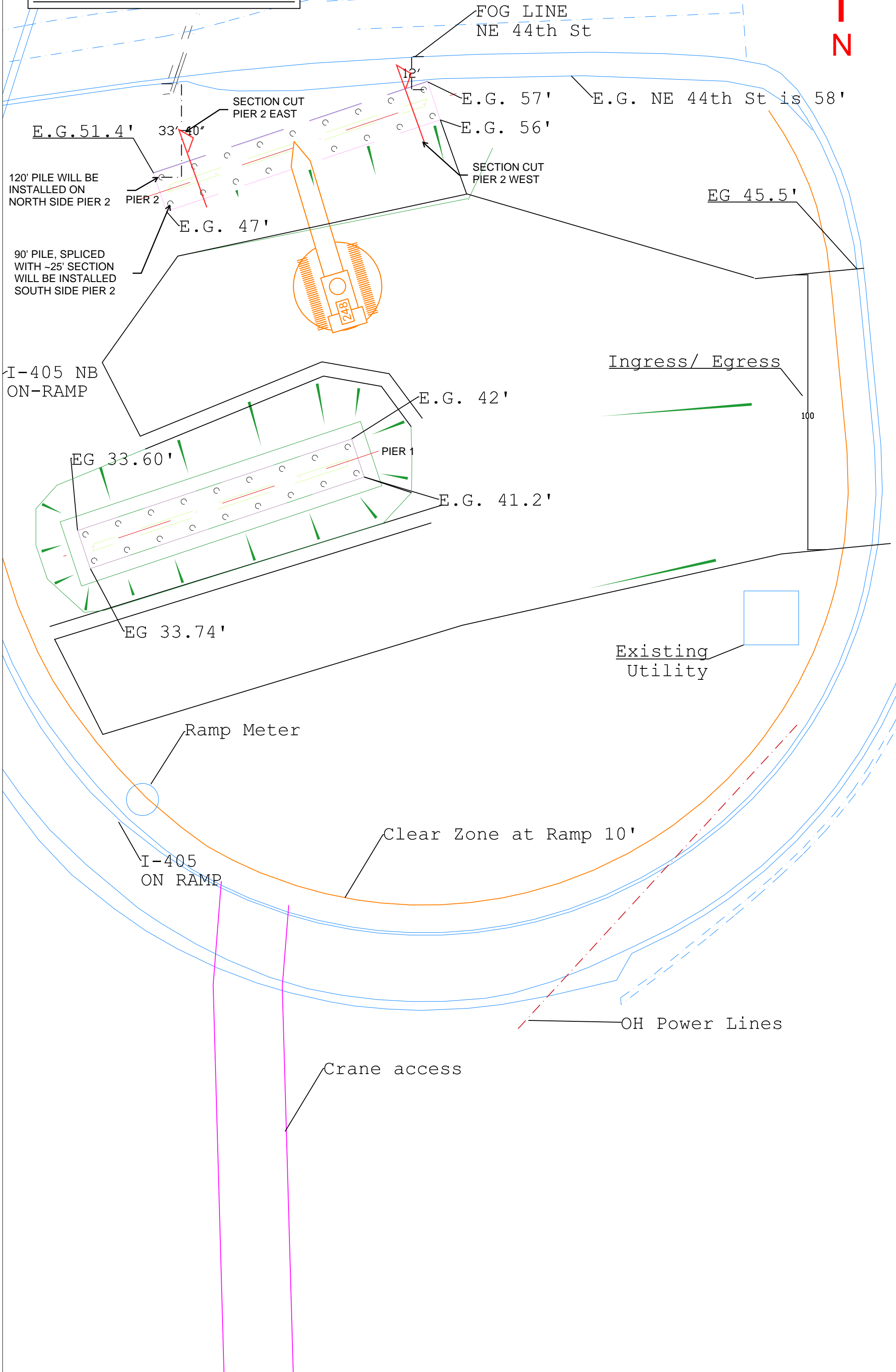
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PLAN VIEW: BRIDGE 26E SITE



East



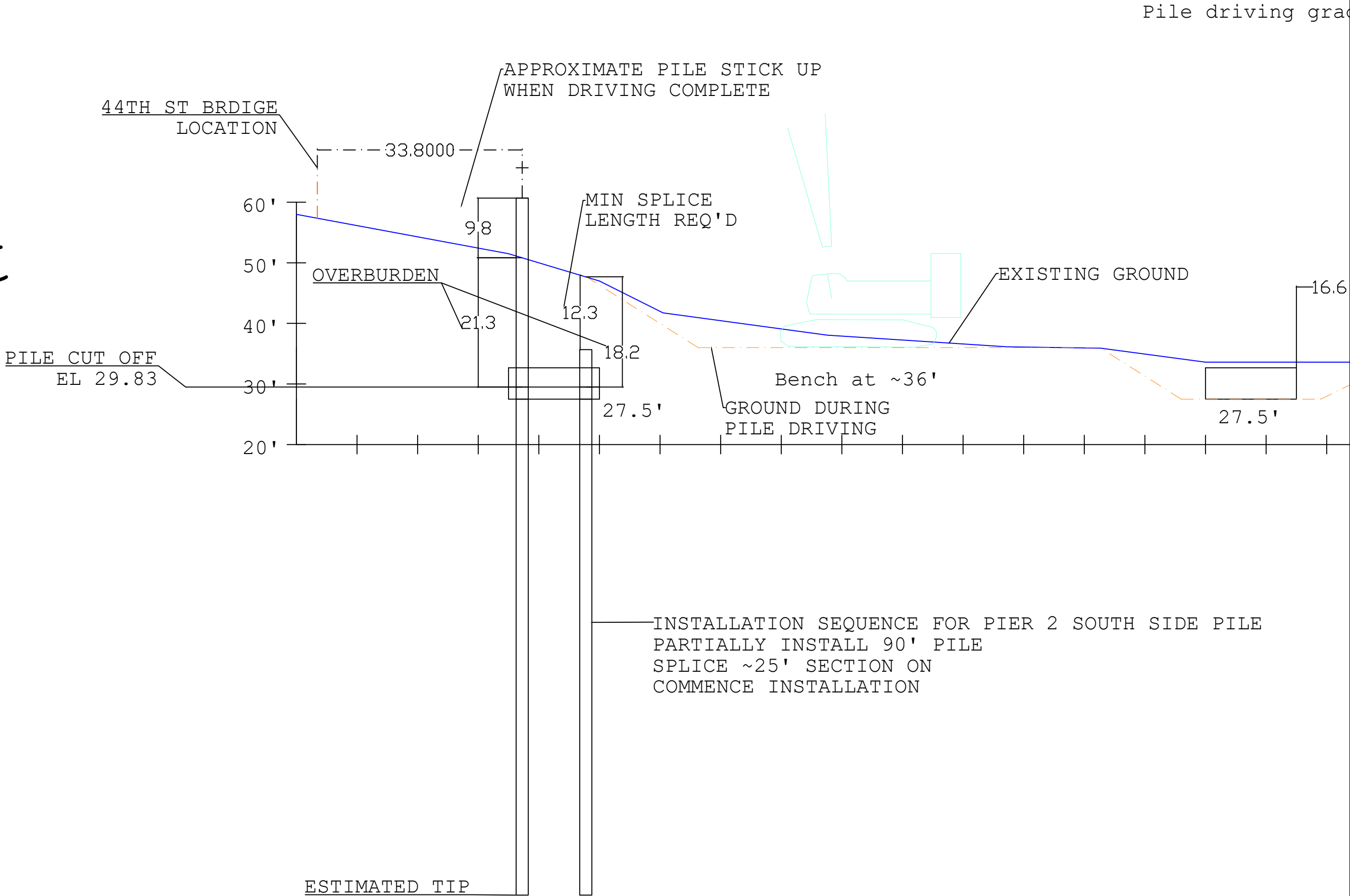
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☐ APPROVED AS NOTED
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—INSTALLATION SEQUENCE FOR PIER 2 SOUTH SIDE PILE
PARTIALLY INSTALL 90' PILE
SPlice ~25' SECTION ON
COMMENCE INSTALLATION

ELEVATION VIEW: SECTION CUT THROUGH WEST OF PIER
SHOWING OVERBURDEN

West



I-405, Renton to Bellevue Widening & and Express Toll Lanes Project

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ELEVATION VIEW: VIBRATORY HAMMER AND TEMPLATE SET UP

- Notes:
- Survey pile locations and place offset hubs
 - Position forklift supported template over pile location
 - Loft pile / vibro into place within template
 - Template will aid in keeping pile within horizontal tolerance
 - Vibro hammer allows pile to be driven and extracted as needed to correct for plan locations and plumbness deviation during driving.
 - A level may also be used to check pile for plumbness periodically.
 - Periodically piles may be checked for plan location by measuring to offset hubs.
 - Pile will be installed using a vibro up to refusal.

VIBRATORY HAMMER

PILE

I-405, Renton to Bellevue Widening & and Express Toll Lanes Project

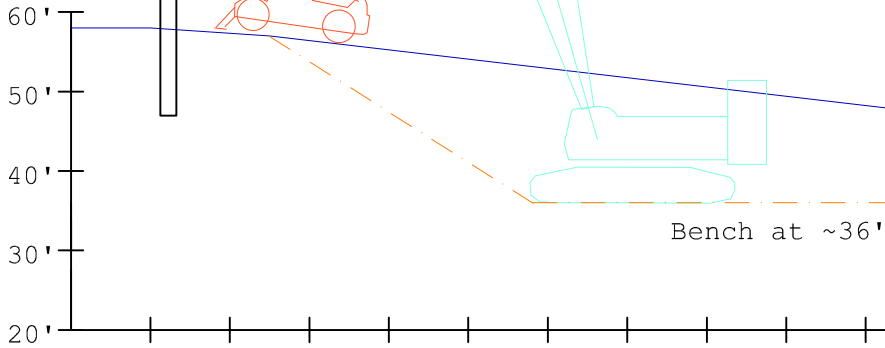
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FORKLIFT SUPPORTED
PILE TEMPLATE

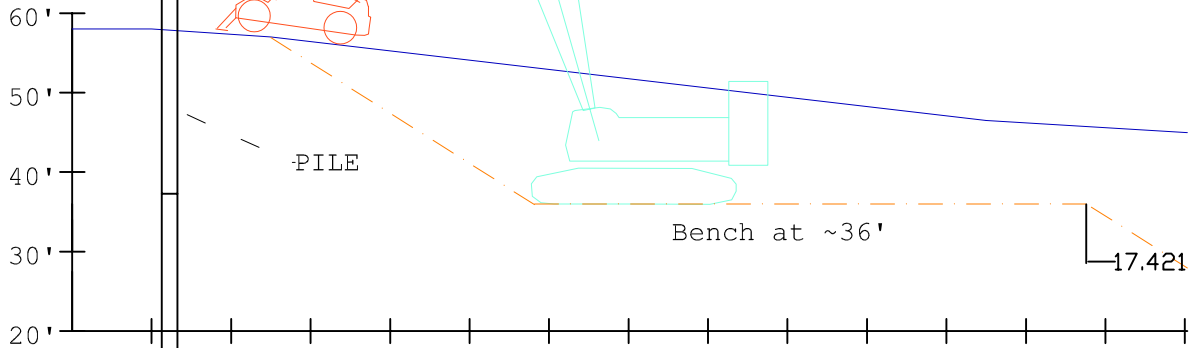


ELEVATION VIEW: LEADS, DIESEL HAMMER, AND TEMPLATE SET UP

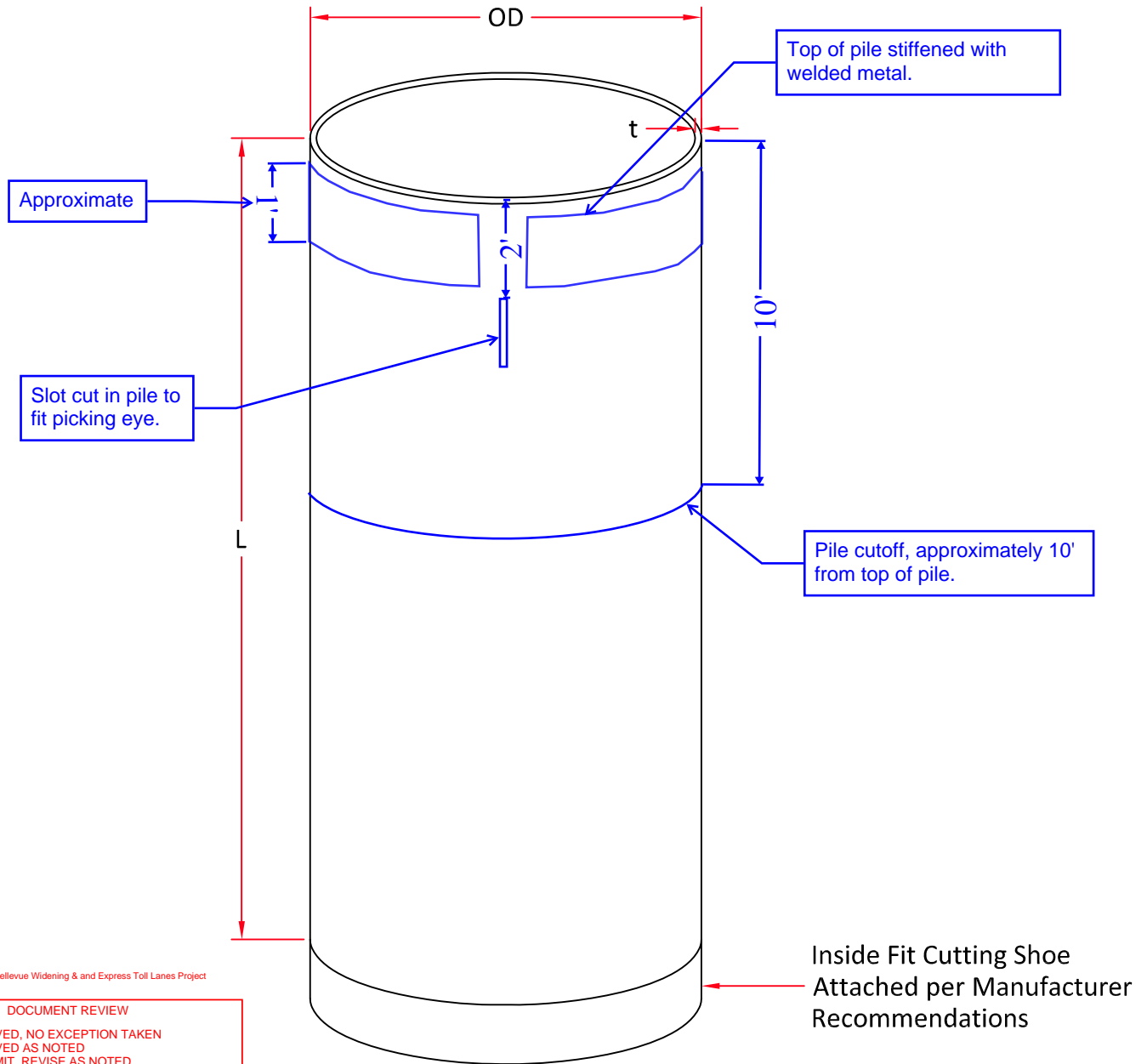
- Notes:
- After initial vibratory install, the pile will be impact driven to required tip and bearing.
 - The pile will have been vibro installed to a sufficient depth such that it is not anticipated to deviate from plan location or plumbness tolerances during impact install.

OFFSHORE LEADS +
DIESEL HAMMER

FORKLIFT SUPPORTED
PILE TEMPLATE



PILE LIFTING EYE AND STIFFENED END SKETCH



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See Pile Schedule Table 1

NOTES:

100% Domestic Melted and Manufactured USA

New, Spiralweld Pipe per ASTM A252 gr.3 w/ 50 ksi min yield per WSDOT General Special Provision 6-05.3(5)

and ASTM A572 Grade 50

REV#	Date	Description	Job #:
0		Released for Approval	
			Date: 02/05/16
			Sheet #:
			Page 1 of 1

Drawn By: E. Bell

skylinesteel
a NUCOR company

8 WOODHOLLOW RD
PARSIPPANY, NEW JERSEY 07054
TEL: (973) 428-6100 FAX: (973) 428-7399

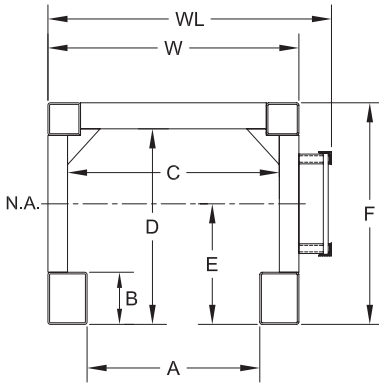


LEADS

Building the World's Foundations

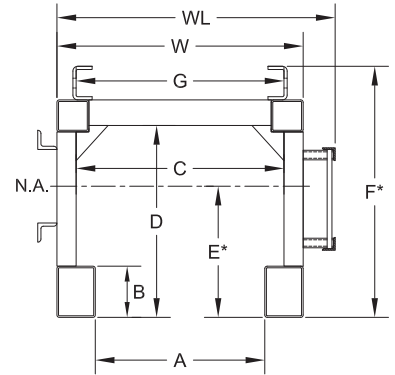
We manufacture, rent, sell and service deep foundation construction equipment.

Box and U Lead Specification Sheet



APE leads have the highest strength on the market. Please consult with APE engineers prior to using this equipment to assure that you have selected the proper size leads for your project.

Lead dimensions may vary from previous manufactured items. Consult factory and provide serial numbers to verify replacement parts.



Without Pin-up Rail

With Pin-up Rail / Auger Rail

Dimensions:	8 X 21	8 X 26	8 X 32	8 X 37	8 X 43	10 X 54
A	21.50	26.50	32.50	37.50	43.50	54.50
B	8.00	8.00	8.00	8.00	8.00	10.00
C	27.50	32.50	38.50	43.50	49.50	62.50
D	30.00	30.00	34.00	42.00	46.00	48.00
E	15.29	15.29	16.94	20.22	21.87	28.00
E*	22.10	22.10	24.50	29.29	31.69	N/A
F	34.00	34.00	38.00	46.00	50.00	54.00
F*	39.25	39.25	43.25	51.25	55.25	N/A
G	27.50	32.50	38.50	43.50	49.50	N/A
W	33.50	38.50	44.50	49.50	55.50	74.50
WL	38.50	43.50	49.50	54.50	60.50	79.50
Wt. (w/o PU-rail)	130 lb/ft	135 lb/ft	141 lb/ft	146 lb/ft	152 lb/ft	280 lb/ft
Wt. (with PU-rail)	165 lb/ft	170 lb/ft	176 lb/ft	181 lb/ft	187 lb/ft	315 lb/ft
Structural Properties (w/o Pinup Rail)						
Mom. of Inertia (Ixx)	3978 in ⁴	3978 in ⁴	5174 in ⁴	8052 in ⁴	9737 in ⁴	23,207 in ⁴
Min. Sec. Mod. (Sxx)	212.7 in ³	212.7 in ³	245.6 in ³	312.4 in ³	346.0 in ³	753.6 in ³
Structural Properties (with Pinup Rail)						
Mom. of Inertia (Ixx)	7020 in ⁴	7020 in ⁴	8925 in ⁴	13,445 in ⁴	16,060 in ⁴	30,597 in ⁴
Min. Sec. Mod. (Sxx)	317.6 in ³	317.6 in ³	364.3 in ³	459.0 in ³	506.9 in ³	1,020 in ³

Material Properties:

Steel Tubing	ASTM A500, Grade B
Tensile Strength	58,000 psi = 40,000 N/m ²
Yield Strength	46,000 psi = 31,700 N/m ²

Phone: (253) 872-0141

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1

F:\J-CHEN\5 FOLDING DIESEL \Diesel-Jack\PIPE
INSERT\NEW PIPE INSERT
1001819-18 34830N PIPE INSERT

SCALE: 1:10 WEIGHT: 1063.27 SHEET 1 OF 3



APE 200-6 VIBRATORY HAMMER

The Worlds Largest Provider of
Foundation Construction Equipment



SPECIFICATIONS	DATA
Eccentric Moment	6,600 in-lbs (76.04 kgm)
Drive Force	255 tons (2,270 kN)
Frequency Maximum (VPM)	0 - 1,650 vpm
Max Line Pull	185 tons (1,646 kN)
Bare Hammer Weight w/o Clamp	18,900 lbs (8,573 kg)
Throat Width	14.75 in (37 cm)
Length	140.00 in (356 cm)
Height w/o Clamp	75.00 in (191 cm)

APE Model 765 Power Unit

SPECIFICATIONS	DATA
Engine Type	Caterpillar C18 Tier II
Horse Power	765 HP (563 kW)
Drive Pressure	0 - 4,500 psi (310 bar)
Drive Flow	220 gpm (833 lpm)
Clamp Pressure	4,800 psi (69,618 bar)
Clamp Flow	10 gpm (3 lpm)
Engine Speed	2,100 rpm
Weight	20,000 lbs (9,072 kg)
Length	152 in (385 cm)
Width	82 in (208 cm)
Height	94 in (239 cm)
Hydraulic Reservoir	450 gal (1,703 L)
Fuel Capacity	150 gal (568 L)



Specifications may vary due to site conditions, specific hammer conditions or product set up.
Specifications may change without notice.
Consult the factory for details on any specific product (800) 248-8498.

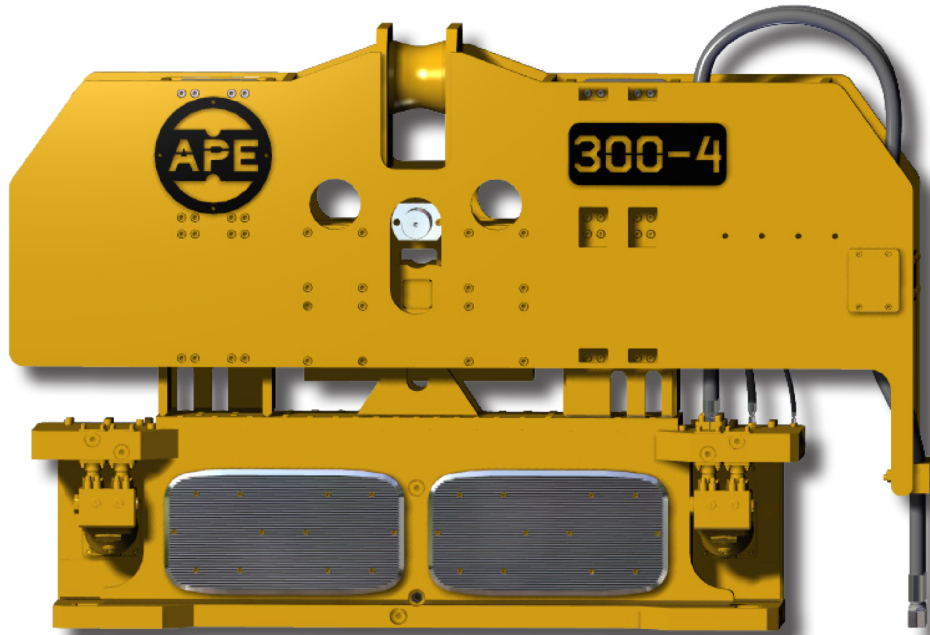


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APE 300-4 VIBRATORY HAMMER

**The World's Largest Provider of
Foundation Construction Equipment**



SPECIFICATION	800 POWER UNIT
Eccentric Moment	5,320 in-lbs (61 kgm)
Drive Force	259 tons (2,300 kN)
Frequency (VPM)	0-1850 vpm
Max Line Pull	133 tons (1,183 kN)
Bare Hammer Weight w/o Clamp	16,850 lbs (7,643 kg)
Shipping Weight w/ 200' Bundle	23,700 lbs (10,751 kg)
Throat Width	22" (56 cm)
Length	126" (319 cm)
Height w/o Clamp	81" (207 cm)
Power Unit Engine Type	CAT C18 TIER IV STAGE V DUAL CERTIFIED
Power Unit Horsepower	800 HP (597 kW)

*Specifications may vary due to site conditions, specific hammer conditions or product set up.
Specifications may change without notice.
Consult the factory for details on any specific product (800) 248-8498.*



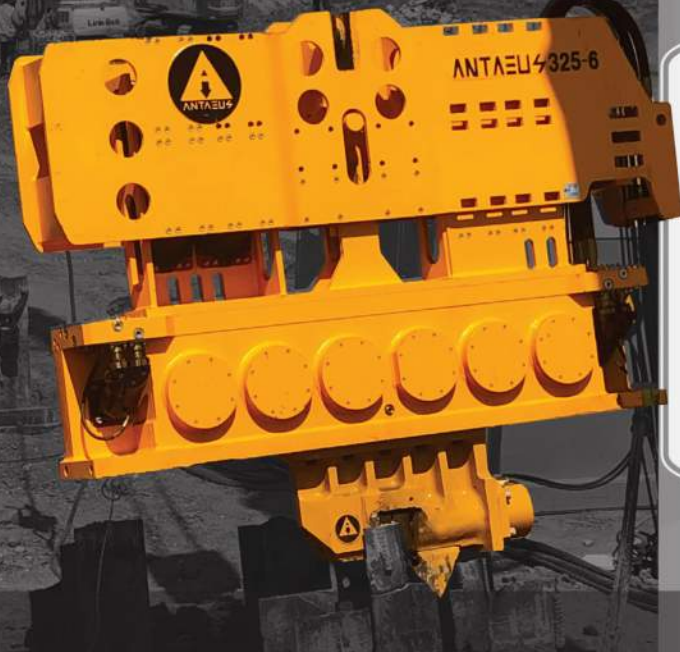
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ANTEUS 325-6 VIBRATORY HAMMER



ANTAEUS 325-6

VIBRATORY PILE DRIVER & EXTRACTOR



ECCENTRIC MOMENT	7,000 IN-LBS	80,6 KG-M
DRIVE FORCE	255 TONS	2 270 KN
FREQUENCY	0-1650 VPM	0-1650 VPM
MAX LINE PULL	185 TONS	1 646 KN
WEIGHT *W/O CLAMPS	19,450 LBS	8 822 KG
THROAT WIDTH	16.75 INCHES	42,54 CM
LENGTH	140 INCHES	140 INCHES
HEIGHT	75 INCHES	191 CM

ENGINE TYPE	TIER 4, STAGE 5 C18	
HORSE POWER	800 HP	597 KW
ENGINE SPEED	1,800 RPM + UPDRIVE™	
DRIVE PRESSURE	4,500 PSI	331 BAR
DRIVE FLOW	231 GPM	874 LPM
CLAMP PRESSURE	4,800 PSI	350 BAR
CLAMP FLOW	10 GPM	3 LPM
WEIGHT (ALL FLUIDS)	23,900 LBS	10 840 KG
LENGTH	185 INCHES	470 CM
HEIGHT	95 INCHES	241 CM
HYDRAULIC RESERVOIR SIZE	800 GAL	3 028 LITERS
SPARE HYD RESERVOIR SIZE	55 GAL	208 LITERS
FUEL CAPACITY	150 GAL	567 LITERS

800HP POWER UNIT

- OPERATES VIBROS, DRILLS & IMPACTS
- SPARE HYDRAULIC TANK
- FULL FORWARD AND REVERSE
- MEETS EUROPEAN REGULATIONS



2021

APE Model D80-42 Single Acting Diesel Impact Hammer

D80-42 in an offshore Leader.



MODEL D80-42 (8.0 metric ton ram)

SPECIFICATIONS

Stroke at maximum rated energy	135 in (343 cm)
Maximum rated energy (Setting 4)	198,450 ft-lbs (267.91 kNm)
Setting 3	176,621 ft-lbs (238.44 kNm)
Setting 2	146,853 ft-lbs (198.25 kNm)
Minimum rated energy (Setting 1)	127,008 ft-lbs (171.46 kNm)
<i>(Variable throttle allows for infinite fuel settings)</i>	

Maximum obtainable stroke	150 in (381 cm)
Maximum obtainable energy	231,084 ft-lbs (313 kNm)
Speed (blows per minute)	34-53

WEIGHTS (Approximate)

Ram	17,640 lbs (8,000 kg)
Anvil	4,670 lbs (2,118 kg)
Anvil cross sectional area	630.47 in ² (4067.54 cm ²)
Hammer weight (includes trip device)	38,434 lbs (17,433 kg)
Typical operating weight (with offshore leader)	Consult Factory

CAPACITIES

Fuel tank (runs on diesel or bio-diesel)	40.3 gal (96.52 liters)
Oil tank	8.3 gal (31 liters)

Optional Variable Throttle Control.



CONSUMPTION

Diesel or Bio-diesel fuel	6.5 gal/hr (24.6 liters/hr)
Lubrication	0.67 gal/hr (1.96 liters/hr)
Grease	8 to 10 pumps every 20 minutes of operation time.

STRIKER PLATE

Weight	1,036 lbs (470 kg)
Diameter	25 in (63.5 cm)
Area	471 sq-in (696 sq-cm)
Thickness	8 in (20.32 cm)

Cushion material.



CUSHION MATERIAL

Type/Qty	Micarta / 3 each
Diameter	25 in (63.5 cm)
Thickness	1 in (25.4 mm)
Type/Qty	Aluminum / 4 each
Thickness	1/2 in (12.7 mm)
Diameter	25 in (63.5 cm)
Total Combined Thickness	5 in (12.7 cm)
Area	491 in ² (3167.74 cm ²)
Elastic-modulus	285 ksi (1,965 mpa)
Coeff. of restitution	0.8

Typical 54" offshore.



OFFSHORE LEADER

Offshore for 98"/2.5 meter piles and under	Consult Factory
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MINIMUM BOX LEAD SIZE/OPERATING LENGTH

Minimum box leader size	8 in x 37 in (20.32 cm x 94 cm)
Operating length for offshore leader	384 in (975.36 cm)



Corporate Offices
7032 South 196th
Kent, Washington 98032 USA
(800) 248-8498 & (253) 872-0141
(253) 872-8710 Fax

Visit our WEB site:
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e-mail: ape@apevibro.com

APE D100-42 Single Acting Diesel Impact Hammer

D100-42 in a bottom drive.



MODEL D100-42 (10.0 metric ton ram)

SPECIFICATIONS

Stroke at maximum rated energy	135 in (343 cm)
Maximum rated energy (Setting 4)	248,063 ft-lbs (334.88 kNm)
Setting 3	220,776 ft-lbs (298.05 kNm)
Setting 2	191,008 ft-lbs (257.86 kNm)
Minimum rated energy (Setting 1)	158,760 ft-lbs (214.33 kNm)
<i>(Variable throttle allows for infinite fuel settings)</i>	

Maximum obtainable stroke	150 in (381 cm)
Maximum obtainable energy	288,488 ft-lbs (391 kNm)
Speed (blows per minute)	34-53

WEIGHTS

Piston	22,050 lbs (10,000 kg)
Anvil	4,670 lbs (2,118 kg)
Anvil cross sectional area	482.8 in ² (3114.83 cm ²)
Hammer weight (includes hydraulic trip device)	47,000 lbs (21,318 kg)
Typical operating (weight with offshore leader)	Consult Factory

CAPACITIES

Fuel tank (runs on diesel or bio-diesel)	40.3 gal (153 liters)
Oil tank	8.3 gal (31.5 liters)

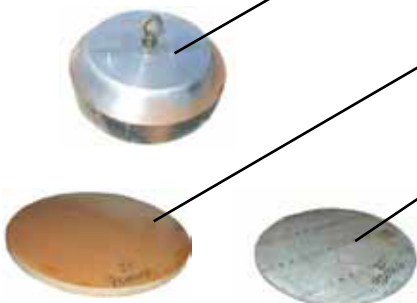
CONSUMPTION

Diesel or Bio-diesel fuel	7.8 gal/hr (30 liters/hr)
Lubrication	0.67 gal/hr (2.5 liters/hr)
Grease	8 to 10 pumps every 20 minutes of operation time.

STRIKER PLATE

Weight	1,036 lbs (470 kg)
Diameter	25 in (57.15 cm)
Area	491 in ² (3167.74 cm ²)
Thickness	8 in (20.32 cm)

Cushion material.



CUSHION MATERIAL

Type/Qty	Micarta / 2 each
Diameter	25 in (57.15 cm)
Thickness	1 in (25.4 mm)
Type/Qty	Aluminum / 3 each
Thickness	1/2 in (12.7 mm)
Diameter	25 in (57.15 cm)
Total Combined Thickness	3.5 in (8.89 cm)
Area	491 in ² (3167.74 cm ²)
Elastic-modulus	285 ksi (1,965 mpa)
Coeff. of restitution	0.8

Typical 54" offshore.



STANDARD OFFSHORE LEADER

8"x54" for 48" piles and under	Consult Factory
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MINIMUM BOX LEAD SIZE/OPERATING LENGTH

Minimum box leader size	8 in x 37 in (20.32 cm x 94 cm)
Operating length for offshore leader	396 in (1005.84 cm)



Corporate Offices
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Kent, Washington 98032 USA
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(253) 872-8710 Fax

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WSDOT CORRESPONDACE: NON-FIXED LEADS

Alexander, Ilima (external)

From: Lefotu, John <LefotuJ@wsdot.wa.gov>
Sent: Wednesday, November 3, 2021 1:57 PM
To: Alexander, Ilima (external); Russell, Elizabeth (Consultant); Sanchez, Guillermo (Consultant); Pang, Jason (Consultant); Drabick, Andrew (Consultant); Felice, Conrad (Consultant)
Cc: Gorham, Jon
Subject: RE: [EXTERNAL] FW: Br26E Pile Template and Request for Approval of Non-Fixed Leads

CAUTION: This email came from outside of the organization. Think before clicking on links and attachments.

Ilima, Jon,

As previously discussed, WSDOT takes “No Exception” to the alternate methods as proposed by FLJV for the subject submittal for Bridge 26E Pier 1 in lieu of “Fix Lead” required under 6-05.3(9)C. FLJV is proposing the use of a vibratory head and template to initially drive the pile in true alignment. Please note that it is FLJV’s responsibility to make sure the piles are in compliance with tolerance requirements.

WSDOT encourage NCRs if the pile is out of tolerance otherwise WSDOT will write NCI’s to make sure we are meeting tolerance requirements as the work progresses.

Thank you,

John Lefotu, PE PMP

*Project Engineer, Construction
I-405 RTB Widening and ETL
Desk: 425-420-2650 Ext 114
Mobile: 425-247-6655
lefortuj@wsdot.wa.gov*

From: Alexander, Ilima (external) <ialexander@FlatironLaneJV.com>
Sent: Tuesday, November 2, 2021 2:56 PM
To: Russell, Elizabeth (Consultant) <RusselE@consultant.wsdot.wa.gov>; Sanchez, Guillermo (Consultant) <SancheG@consultant.wsdot.wa.gov>; Pang, Jason (Consultant) <PangJ@consultant.wsdot.wa.gov>; Drabick, Andrew (Consultant) <DrabicA@consultant.wsdot.wa.gov>; Lefotu, John <LefotuJ@wsdot.wa.gov>;

Felice, Conrad (Consultant) <FeliceC@consultant.wsdot.wa.gov>

Cc: Gorham, Jon <JGorham@flatironcorp.com>

Subject: [EXTERNAL] FW: Br26E Pile Template and Request for Approval of Non-Fixed Leads

WARNING: This email originated from outside of WSDOT. Please use caution with links and attachments.

WSDOT Team,

Per discussion at the Structures / Geotech OTS meeting on 11/2 WSDOT indicated the pile driving template shown in the attached and described below may be used in lieu of fixed leads.

At your earliest convenience please respond back to this email confirming approval for FLJV to move forward with using non-fixed leads for pile driving at bridge 26E.

Thank you,

Ilima Alexander

Field Engineer

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From: Alexander, Ilima (external) <ialexander@FlatironLaneJV.com>

Sent: Thursday, September 2, 2021 9:21 AM

To: RusselE@consultant.wsdot.wa.gov; SancheG@consultant.wsdot.wa.gov; PangJ@consultant.wsdot.wa.gov; FeliceC@consultant.wsdot.wa.gov; DrabicA@consultant.wsdot.wa.gov; LefotuJ@wsdot.wa.gov

Cc: JGorham@flatironcorp.com; khorton@flatironcorp.com; eestelle@flatironcorp.com

Subject: Br26E Pile Template and Request for Approval of Non-Fixed Leads

All,

Attached are photos and sketches of the pile driving template we've fabricated for pile driving at bridge 26E. We plan to use a fork-lift-supported pile driving template made of welded channels and angle iron. The welded angle and channel frame that the pile will be driven through is dimensioned 30" x 30". This gives 3" space on all sides of the pile which will aid FLJV in guiding the pile so that it does not walk more than 6 inches from horizontal plan location as required per WSDOT Spec. Section 6-05.3(11)A. Wood shims bolted to the pile side of the frame will prevent gouging or other damage to the pile.

FLJV plans to use a forklift supported template in lieu of the driven h-pile supported template proposed for bridge 25E. This option is beneficial for the following reasons:

- Pier 2 piles will be installed on an elevated slope with traffic constraints, so a driven h-pile supported template is more difficult to use.
- The pile driving superintendent has experience using both styles of templates. In his experience both template models are equally effective in aiding to successfully drive pile within horizontal plan location tolerances.

A vibratory hammer will be used for initial install of the pile. The vibratory hammer will be stopped periodically so the pile may be checked for plumbness and plan location. If the pile begins to walk FLJV can use the vibratory hammer to extract and correct the pile. The vibratory hammer will install the pile a minimum of 20ft into the ground and up to hammer refusal. After vibratory install, an impact hammer will be used to drive the pile to minimum tip and bearing. During impact driving the pile is not expected to walk due to the support from the soil which it's driven through.

Please let us know if we can answer any questions on the template and/or pile driving equipment submittal. If not, please confirm here WSDOT permits use of swinging leads for this structure in accordance with Standard Specification Section 6-05.3(9)C, and we'll include this email in the pile driving equipment submittal.

Thanks,

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